

8/4/03



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|----|-------------|----|---------|
| WO | WO 94/38523 | A2 | 12/1998 |
| WO | WO 94/39523 | A3 | 12/1998 |
| WO | WO 99/01959 | A3 | 1/1999 |
| WO | WO 99/14975 | A3 | 3/1999 |
| WO | WO 99/14975 | A2 | 3/1998 |
| WO | WO 99/18685 | A1 | 4/1999 |
| WO | WO 99/19995 | A1 | 4/1999 |
| WO | WO 99/23894 | A3 | 5/1999 |
| WO | WO 99/23844 | A2 | 5/1999 |
| WO | WO 99/44341 | A1 | 9/1999 |
| WO | WO 01/30633 | A1 | 7/2001 |
| WO | WO 01/30669 | A1 | 7/2001 |

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|----|-------------|----|--------|
| WD | WO 99/18685 | A1 | 4/1999 |
| WO | WO 99/19995 | A1 | 4/1999 |
| WO | WO 99/23844 | A3 | 5/1999 |
| WO | WO 99/23844 | A2 | 5/1999 |
| WO | WO 99/44341 | A1 | 9/1999 |
| WO | WO 01/50633 | A1 | 7/2001 |
| WO | WO 01/50669 | A1 | 7/2001 |

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|----|----------------|--------|
| WO | WO 94/4031 A1 | 9/1999 |
| WO | WO 01/50633 A1 | 7/2001 |
| WO | WO 01/50669 A1 | 7/2001 |

OTHER PUBLICATIONS

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The invention provides a method and system for adaptive control to multipoint wireless communication. The wireless physical layer and the wireless media-access-control (MAC) layer collectively include a set of parameters, which are adaptively modified by a base station controller for communication with a plurality of customer premises equipment. The base station controller adjusts communication with each customer premises equipment individually and adaptively in response to changes in characteristics of communication, including physical characteristics, amount of communication traffic, and nature of application for the communication traffic.

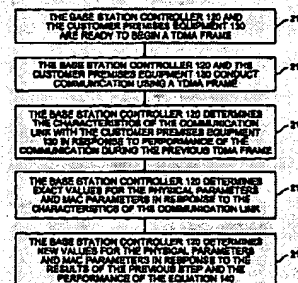
39 Claims, 1 Drawing Sheet

- (56) **References Cited**
- U.S. PATENT DOCUMENTS**
- | | |
|-------------|-----------------------|
| 5,546,397 A | 8/1996 Mahany |
| 5,546,411 A | 8/1996 Leitch et al. |
| 5,553,316 A | 9/1996 Desprez et al. |

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

- | | | |
|----|----------------|--------|
| DE | 197 28 409 A1 | 7/1999 |
| WO | WO 97/17768 A1 | 5/1997 |



DOCUMENT-IDENTIFIER: US 2002080719 A1

TITLE: Scheduling transmission of data over a transmission channel based on signal quality of a receive channel

----- KWIC -----

Application Filing Date - APD (1):
20001222

Summary of Invention Paragraph - BSTX (13):
[0011] However, there are situations where it is desirable to have an ARQ protocol running between the base station and the UE. For example, data transmission rates can be increased by locating the ARQ retransmission mechanism as close to the radio interface as possible, thereby reducing delays associated with internal signaling in the radio access network, e.g., signaling between the RNC and base station. If the ARQ or HARQ protocol resides in the base station rather than the RNC, the ARQ feedback signaling carrying acknowledgments and/or retransmission requests from a UE terminates much faster in the base station. The BS-RNC signaling load is also decreased.



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(19) United States
(12) Patent Application Publication
Parkvall et al.
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(45) Pub. Date: Jun. 27, 2002

(54) SCHEDULING TRANSMISSION OF DATA OVER A TRANSMISSION CHANNEL BASED ON SIGNAL QUALITY OF A RECEIVE CHANNEL

Publication Classification

(51) Int. Cl. H04L 1/16
(52) U.S. Cl. 370/234, 370/232

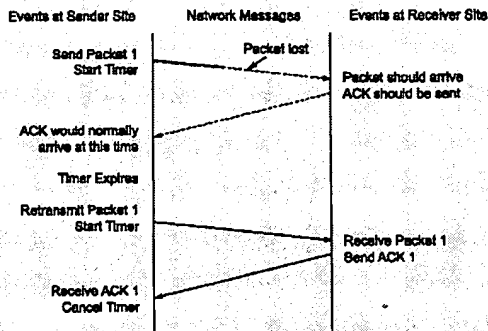
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(21) Appl. No.: 09/742,283

(22) Filed: Dec. 22, 2000

(57) ABSTRACT
Data traffic is selectively transmitted in one direction when the quality or condition of the channel in the opposite direction is sufficient to ensure a reasonable or high likelihood that the transmission will accurately receive and decode feedback messages. In one preferred, non-limiting, example embodiment, a base station schedules transmission of data packets to a user equipment unit (UE) over a downlink traffic channel when the uplink channel over which the UE sends ARQ type signals to the base station has a signal-to-interference ratio (SIR) greater than a predetermined threshold. The downlink channel condition is also preferably taken into account.



Same as before

Detail Description Paragraph - DETX (504):

[0558] Every once in a while, a packet is lost through noise or other interference in the wireless medium. When this situation arises, the subscriber CPE station 294d determines that it has not received a UAB data acknowledgment, so it sends a retransmit request requesting another uplink reservation slot to wireless base station 302 via WAP 290d, which transmits the request to link layer acknowledgment (ARQ) processor 1678. ARQ processor 1678 informs MAC uplink subframe scheduler 1666 of the need of retransmission (i.e. the need of a frame slot reservation for resending the uplink packet). CPE subscriber station 294d can also send to ARQ processor 1678, other data messages about nonreceipt of uplink transmission acknowledgments. The ARQ 1678 can forward such messages on to the uplink subframe scheduler 1666. The uplink subframe scheduler 1666 in turn reschedules the requested uplink reservation from the appropriate class queues 1664a-1664f. Alternatively, in another embodiment, link layer acknowledgment processor 1678 can also send a positive UAB acknowledgment to the subscriber CPE station 294d, to indicate that the data packets have been properly received. Thus uplink scheduler 1666 in addition to scheduling first time reservations, also can schedule repeat reservations for lost packets.

Detail Description Paragraph - DETX (530):

[0584] In step 532, since there was a duplicate acknowledgment detected in step 528, it is determined whether the packet was successfully transmitted, or not. Step 532 is performed via intercommunication between TCP adjunct agent 510e and PRIMMA MAC layer 504d. This is an example of



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(54) TRANSMISSION CONTROL
PROTOCOL/INTERNET PROTOCOL
(TCP/IP) PACKET-CENTRIC WIRELESS
POINT TO MULTI-POINT (PTMP)
TRANSMISSION SYSTEM ARCHITECTURE

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(*) Notice: This is a publication of a examined pro-
cession application (CPA) filed under 37
CFR 1.52(a).

(21) Appl. No.: 09/343,677

(22) Filed: Jul. 9, 1999

Related U.S. Application Data

(63) Non-provisional of provisional application No.
60/072,452, filed on Jul. 10, 1998.

Publication Classification

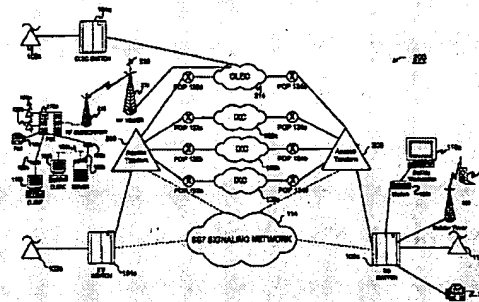
(51) Int. Cl. G06F 15/16
(52) U.S. Cl. 709/248; 709/223; 370/310

ABSTRACT

A packet-centric wireless point to multi-point telecommu-
nications system includes a wireless base station commu-

nicated via a packet-centric protocol to a first data network;
one or more host workstations communicating via the
packet-centric protocol to the first data network; one or more
subscriber customer premises equipments (CPE) stations
coupled with the wireless base station over a shared band-
width via the packet-centric protocol over a wireless
medium; and one or more subscriber workstations coupled
via the packet-centric protocol to each of the subscriber CPE
stations over a second network. The packet-centric protocol
can be transmission control protocol/internet protocol (TCP/
IP). The packet-centric protocol can be a user datagram
protocol/internet protocol (UDP/IP). The system can include
a resource allocation means for allocating shared bandwidth
among the subscriber CPE stations. The resource allocation
is performed to optimize end-user quality of service (QoS).
The wireless communication medium can include at least
one of a radio frequency (RF) communications medium; a
cable communications medium; and a satellite communica-
tions medium. The wireless communication medium can
further include a telecommunications access method includ-
ing at least one of a time division multiple access (TDMA)
access method; a time division multiple access/time division
duplex (TDMA/TDD) access method; a code division mul-
tiple access (CDMA) access method; and a frequency divi-
sion multiple access (FDMA) access method.

The first data network includes at least one of a wireless
network; a wireless network; a local area network (LAN);
and a wide area network (WAN). The second network
includes at least one of a wireless network; a wireless
network; a local area network (LAN); and a wide area
network (WAN).



Search List Rows

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2 and 11

#	U	A	Document ID	Issue Date	Page	Title	Current OR	Current XRef	Retrieval	Inventor	S	C
1		<input type="checkbox"/>	US 20020099854	20020725	88	TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL (TCP/IP) P	709/249	370/310; 709/223		JORGENSEN, JACOB W.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2		<input type="checkbox"/>	US 20020080719	20020627	17	Scheduling transmission of data over a transmission channel based on signal	370/235	370/252		Parkvall, Stefan et al.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3		<input type="checkbox"/>	US 6680922 B1	20040120	86	Method for the recognition and operation of virtual private networks	370/328	370/338		Jorgensen, Jacob W.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	US 6665522 B1	20031216	13	Method and arrangement in a radio communication system		370/475; 370/479		Lundstrom, Anders et al.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	US 6654384 B1	20031125	10	Integrated self-optimizing multi-parameter and multi-variable po	370/469	370/235; 370/329		Reza, Majidi-Ahv et	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	US 6640248 B1	20031028	86	Application-aware, quality of service (QoS) sensitive, media access control	709/226	370/328; 370/338		Jorgensen, Jacob W.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	US 6628629 B1	20030930	87	Reservation based prioritization method for wireless transmission of l	370/322	370/329; 370/341		Jorgensen, Jacob W.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	US 6594246 B1	20030715	86	IP-flow identification in a wireless point-to-multi-point transmission sys	370/338	370/468		Jorgensen, Jacob W.	<input checked="" type="checkbox"/>	<input type="checkbox"/>